CLAIMS

1. An injector for fuel injection systems of internal combustion engines, in particular direct-injection diesel engines, having a piezoelectric actuator (16), which is located in an injector body (10) and is held in contact with the injector body (10) on one side and with a sleevelike booster piston (32) on the other via first spring means (34), having a nozzle body (20), which is joined to the injector body (10) and has at least one nozzle outlet opening (26, 27) and in which a stepped nozzle needle (21) is guided axially displaceably, having second spring means (28), disposed inside the booster piston (32), which - together with the injection pressure acting on the back side of the nozzle needle (21) - keep the nozzle needle (21) in the closing position, and having a control chamber (42), which is embodied on the end toward the nozzle needle of the booster piston (32) and which communicates, via at least one leakage gap (43, 45, 47), with a fuel supply (18) that is at injection pressure, and the nozzle needle (21) is urged in the opening direction (35) by the fuel located in the control chamber (42), characterized in that the booster piston (32) actuated by the piezoelectric actuator (16) is spatially associated directly with the nozzle needle (21), in such a way that the nozzle needle (21) is fitted, with a rear region (30) that has a larger diameter than a region of the nozzle needle (21) toward the nozzle outlet, into the inner chamber (31) of the booster piston (32).

2. The injector according to claim 1, in which the nozzle body (20) adjoins the injector body (10) on the face end in the flow direction (49), characterized in that the piezoelectric actuator (16) extends substantially as far as the (lower) end (24), toward the nozzle body, of the injector body (10).

3. The injector according to claim 1 or 2, in which the cylindrical piezoelectric actuator (16) is centered in an axial cylindrical recess (15) of the injector body (10) in such a way that an annular chamber (17) is created between the outer wall of the piezoelectric actuator (16) and the inner wall of the cylindrical recess (15) of the injector body (10), characterized in that the annular chamber (17) communicates hydraulically directly with the fuel supply (18) that is at injection pressure (high pressure).

4. The injector according to claim 3, characterized in that the annular chamber (17) also extends into the region of the booster piston (32) axially adjoining the piezoelectric actuator (16), and that the inner chamber (31) of the booster piston (32) communicates hydraulically with the annular chamber (17) and thus with the fuel supply (18).

5. The injector according to claim 4, characterized in that a compression spring (34) concentrically surrounding the booster piston (32) is located in the (lower) region of the annular chamber (17) associated with the booster piston (32), and the compression spring is braced, toward the piezoelectric actuator, on a collar (33) of the booster piston (32) and, toward the nozzle outlet, on a rear (upper) end face (23) of the nozzle body (10), in such a way that the piezoelectric actuator (16) and the booster piston (32) are kept in contact with one another by nonpositive engagement.

6. The injector according to one or more of the foregoing claims, characterized in that the nozzle needle (21) is guided in the inner chamber (31) of the booster piston (32), forming a cylindrical leakage gap (47), in such a way that a hydraulic communication is

created between the inner chamber (31) of the booster piston (32), which is at injection pressure (high pressure), and the control chamber (42).

7. The injector according to one or more of the foregoing claims, characterized in that the booster piston (32) is guided in the nozzle body (20), forming a (further) leakage gap (43), in such a way that a hydraulic communication is created between the annular chamber (17) that is at injection pressure (high pressure) and the control chamber (42).

8. The injector according to one or more of the foregoing claims, in which, in the region of the nozzle body (20) toward the nozzle outlet, a cylindrical pressure chamber (37) concentrically surrounding the nozzle needle (21) is embodied, which communicates hydraulically with the fuel supply (18) that is at injection pressure (high pressure), characterized in that in the nozzle body (20), to the rear of the cylindrical pressure chamber (37), an axial recess (44) is embodied, in which the nozzle needle (21) is guided, forming a (further) leakage gap (45), in such a way that a hydraulic communication is created between the cylindrical pressure chamber (37) that is at injection pressure (high pressure) and the control chamber (42).

9. The injector according to claim 8, in which the nozzle body (20) is secured to the injector body (10) by means of a union nut (clamping nut 22), characterized in that between the outer wall of the nozzle body (20) and the inner wall of the union nut (22), a cylindrical gap (40) is embodied which communicates hydraulically - via recesses (38, 39) machined into the nozzle body (20) - on one side with the annular chamber (17) and on the other with the cylindrical pressure chamber (37).